



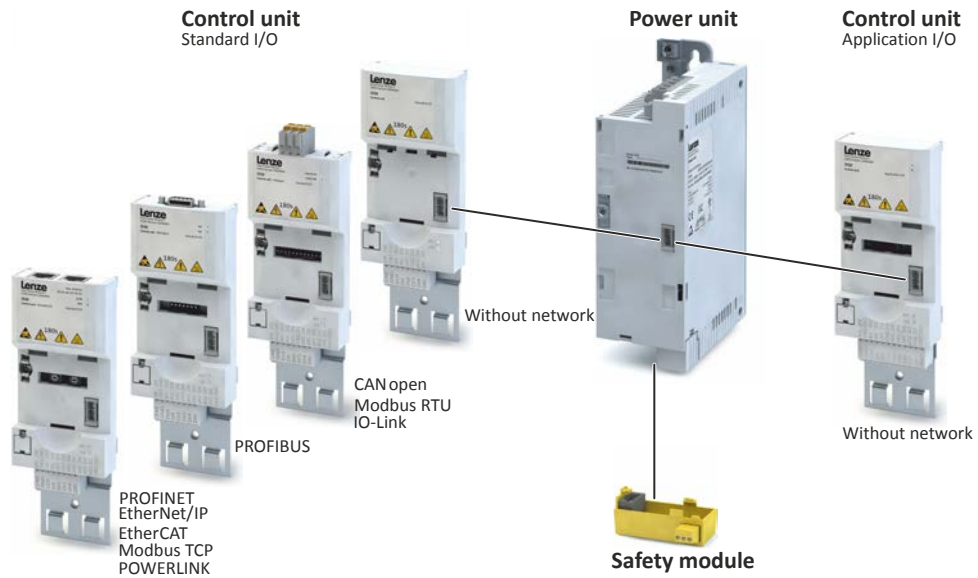
## Product extensions

### Overview

The inverters can easily be integrated into the machine. The scalable product extensions serve to flexibly match the required functions to your application.

The control unit with standard I/O can be extended with different networks.

The control unit with application I/O provides additional inputs and outputs (I/Os). A network component is not available.



# Product extensions

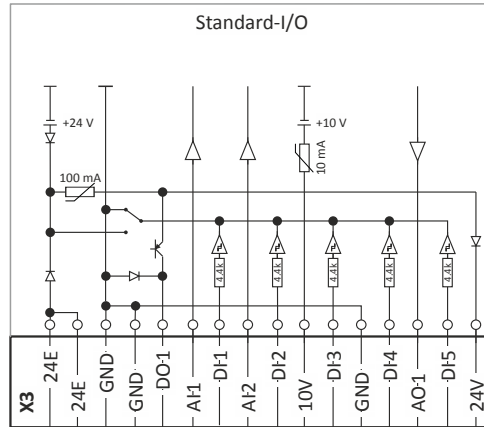
I/O extensions  
Standard I/O



## I/O extensions

### Standard I/O

The standard I/O provides the inverter with analog and digital inputs and outputs and is designed for standard applications. The standard I/O is available with different networks.



Digital inputs	Terminal X3: DI1, DI2, DI3, DI4, DI5	DI3/DI4 can be optionally used as frequency or encoder input. HIGH active/LOW active switchable
Digital outputs	Terminal X3: DO1	
Analog inputs	Terminal X3: AI1, AI2	Can be optionally used as voltage or current input.
Analog outputs	Terminal X3: AO1	Can be optionally used as voltage or current output.
24-V input	Terminal X3: 24E	Mains-independent DC supply of the control electronics (incl. communication)
10-V output	Terminal X3: 10V	Reference voltage for setpoint potentiometer
24-V output	Terminal X3: 24V	
Reference potential	Terminal X3: GND	
Connection system	Pluggable spring terminal	

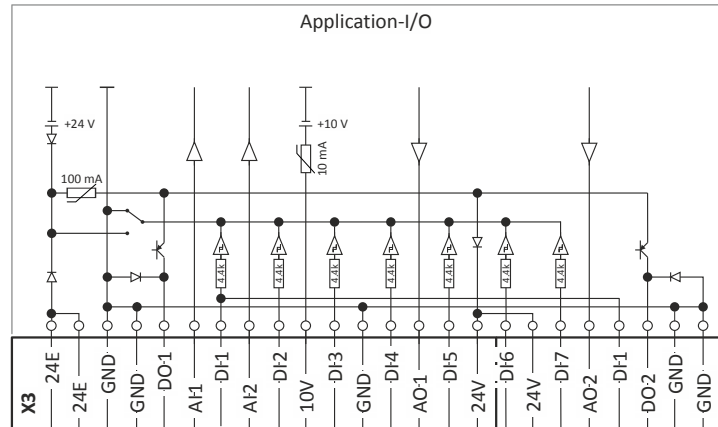


## Product extensions

I/O extensions  
Application I/O

### Application I/O

In addition to the standard I/O, the application I/O provides the inverter with more digital and analog inputs and is intended for individual applications. The combination with network components is not available.



Digital inputs	Terminal X3: DI1, DI2, DI3, DI4, DI5, DI6, DI7	DI3/DI4 can be optionally used as frequency or encoder input. HIGH active/LOW active switchable
Digital outputs	Terminal X3: DO1, DO2	
Analog inputs	Terminal X3: AI1, AI2	can be optionally used as voltage or current input.
Analog outputs	Terminal X3: AO1, AO2	Can be optionally used as voltage or current output.
24-V input	Terminal X3: 24E	Mains-independent DC supply of the control electronics (incl. communication)
10-V output	Terminal X3: 10V	Reference voltage for setpoint potentiometer
24-V output	Terminal X3: 24V	
Reference potential	Terminal X3: GND	
Connection system	Pluggable spring terminal	

# Product extensions

I/O extensions  
Data of control connections



## Data of control connections

### Digital inputs

Switching type		PNP, NPN	Parameterisable
PNP switching level			
LOW	V	< +5	IEC 61131-2, type 1
HIGH	V	> +15	
NPN switching level			
LOW	V	> +15	
HIGH	V	< +5	
Input resistance	kΩ	4.6	
Cycle time	ms	1	
Electric strength of external voltage	V	± 30	

Frequency input			
Connection		X3/DI3, X3/DI4	
Frequency range	kHz	0 ... 100	

Encoder input			
Type		Incremental HTL encoder	
Two-track connection		X3/DI3 X3/DI4	Track A Track B
Frequency range	kHz	0 ... 100	

### Digital outputs

Switching level			
LOW	V	< +5	IEC 61131-2, type 1
HIGH	V	> +15	
max. output current	mA	100	Total current for DO1 and 24V
Cycle time	ms	1	
Short-circuit strength		Unlimited period	
Electric strength of external voltage	V	± 30	
Polarity reversal protection		Integrated freewheeling diode for switching the inductive load	
Overload behaviour		Reduced voltage or periodic switch-off/on	
Reset or switch-on behaviour		Output is switched off	LOW



## Product extensions

I/O extensions  
Data of control connections

### Analog inputs

Cycle time	ms	1	
Resolution of A/D converter	Bit	12	
Operation as voltage input			
Connection designation		X3/AI1, X3/AI2	
Input voltage DC	V	-10 ... 10	
Input resistance	kΩ	70	
Accuracy	mV	± 50	Typical
Input voltage in case of open circuit	V	- 0.2 ... 0.2	Display "0"
Electric strength of external voltage	V	± 24	
Operation as current input			
Connection designation		X3/AI1, X3/AI2	
Input current	mA	0 ... 20	
		4 ... 20	open-circuit monitored
Accuracy	mA	± 0.1	Typical
Input current in case of open circuit	mA	< 0.1	Display "0"
Input resistance	Ω	< 250	
Electric strength of external voltage	V	± 24	

### Analog outputs

Short-circuit strength		Unlimited period	
Electric strength of external voltage	V	+ 24V	
Operation as voltage output			
Resolution of D/A converter	Bit	12	
Output voltage DC	V	0 ... 10	
max. output current	mA	5	
min. load resistance	kΩ	≥ 2.2	
max. capacitive load	μF	1	
Accuracy	mV	± 100	Typical
Operation as current output			
Output current	mA	0 ... 20	
		4 ... 20	open-circuit monitored
Accuracy	mA	± 0.3	Typical

### 10-V output

Use		Primarily for the supply of a potentiometer (1 ... 10 kΩ)	
Output voltage DC			
Typical	V	10	
Accuracy	mV	± 100	
Max. output current	mA	10	
Max. capacitive load	μF	1	
Short-circuit strength		Unlimited period	
Electric strength of external voltage	V	+ 24	

# Product extensions

I/O extensions  
Data of control connections



## 24-V input

Use		Input for mains-independent DC supply of the control electronics (incl. communication)	
Input voltage DC			
Typical	V	24	IEC 61131-2
Area	V	19.2 ... 28.8	
Input power			
Typical	W	3.6	
Max.	W	6	Depending on the use and state of inputs and outputs.
Input current			
Typical	A	0.150	
Max.	A	1.0	When switching on for 50 ms
Capacity to be charged	µF	440	
Polarity reversal protection		When polarity is reversed: No function and no destruction	
Suppression of voltage pulses		Suppressor diode 30 V, bidirectional	
Power supply unit		SELV/PELV	Externally to create a mains-independent DC supply
Max. current	A	8.0	While looping-through

## 24-V output

Use		Primarily for the supply of digital inputs	
Output voltage DC			
Typical	V	24	
Area	V	16 ... 28	
max. output current	mA	100	Total current for DO... and 24V
Short-circuit strength		Unlimited period	
Electric strength of external voltage	V	+ 30	
Excess current release		Automatically resettable	



## Product extensions

Further control connections  
PTC input

### Further control connections

Terminal description		Relay output	
Connection		X9	
Connection type		Pluggable screw terminal	
Max. cable cross-section	mm <sup>2</sup>	1.5	
Max. cable cross-section	AWG	14	
Stripping length	mm	6	
Stripping length	inch	0.24	
Tightening torque	Nm	0.2	
Tightening torque	lb-in	1.8	
Required tool		0.4 x 2.5	

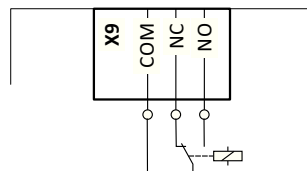
### Relay output



Relay is not suitable for direct switching of a electromechanical holding brake!

Use a corresponding suppressor circuit in case of an inductive or capacitive load!

Connection		Terminal X9: COM	Centre contact (common)
		Terminal X9: NC	NC contact (normally closed)
		Terminal X9: NO	NO contact (normally open)
Minimum DC contact load			
	Voltage	V	10
	Current	mA	10
A correct switching of the relay contacts needs both values to be exceeded simultaneously.			
Switching voltage/switching current			
Maximum	AC 240 V	A	3
	DC 24 V	A	2
	DC 240 V	A	0.16
		According to UL: General Purpose	
		According to UL: Resistive	



### PTC input



In the Lenze setting, motor temperature monitoring is activated! In the delivery status, there is a wire jumper between the terminals T1 and T2. Before connecting a thermal sensor, remove the wire jumper.

Use	Connection of PTC or thermal contact
Connection	Terminal X109: T1 Terminal X109: T2
Sensor types	PTC single sensor (DIN 44081) PTC triple sensor (DIN 44082) Thermal contact

